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1 RECORD OF ORAL HEARING

2
3 UNITED STATES PATENT AND TRADEMARK OFFICE

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6 BEFORE THE BOARD OF PATENT APPEALS
7 AND INTERFERENCES

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10 Ex parte TAKESHI MIYAKAWA
11 and MIKIO SHIMIZU

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14 Appeal 2009-004253
15 Application 10/030,160
16 Technology Center 1700

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19 Oral Hearing Held: July 23, 2009

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23 Before BRADLEY R. GARRIS, ADRIENE LEPIANE HANLON, and
24 BEVERLY A. FRANKLIN, Administrative Patent Judges

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26
27 ON BEHALF OF THE APPELLANT:

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1 MS. BEAN: Good afternoon, Calendar No. 49, Mr. Umbach.

2 JUDGE GARRIS: Good afternoon, Mr. Umbach. Mr. Umbach, it
3 might be helpful if you have a business card if you would give it to the court
4 reporter so that he can get all the names correct and what not.

5 MR. UMBACH: Correct first instead of last.

6 JUDGE GARRIS: And, sir, as you know, you have about 20 minutes
7 to present your case. Please begin when you're ready.

8 MR. UMBACH: Sure. Yeah, the present invention is directed or
9 relates to an embossed carrier tape that can be used for packaging for
10 electronic components. For an example, kind of as noted in the Appeal Brief
11 at page 5, I don't know if you have that available, it shows some figures
12 from one of the applied references, Shen. In particular, Figures 1, 2, and 4
13 show how electronic components, 2, are secured in embossed pockets, 14, of
14 carrier tape, 10, by a cover tape, 46. And before use, the covered carrier
15 tape is rolled up. When the electronic components are ready to be soldered
16 on a substrate, the rolled embossed carrier tape is unrolled, the cover tape is
17 peeled off, you can see that down in Figure 4, and the rolled embossed -- I'm
18 sorry, and the electronic components are removed from the embossed
19 pockets of the carrier tape. And is carrier tape, the same thing as cover tape?
20 No. The cover tape is designed to be pulled away from the carrier tape to
21 expose the electronic component. In contrast, the carrier tape is designed to
22 be pulled by a drive sprocket, 5. After the cover tape is pulled away from
23 the carrier tape, the cover tape no longer provides support for the carrier tape
24 and cannot prevent breakage or tearing of the carrier tape when the sprocket
25 holes in the carrier tape engage the drive sprocket. Now Appellants have
26 discovered that the breakage of embossed carrier tapes during high-speed

1 mounting of electronic components and substrates can be significantly
2 reduced by setting the tear-strength of the embossed carrier tape to at least
3 105 newtons per millimeter as defined by a Japanese industrial standard.

4 Now, the claims are rejected as obvious over Schenz and in view of
5 Maeda and also in view of -- and also over Schenz in view of Miyamoto. As
6 discussed earlier, Shens discloses a carrier tape covered with a cover tape.
7 Schenz is directed to providing a carrier tape that maintains the desired
8 orientation of the electronic component, 2, when the component, 2, is
9 assembled into a new product. However, Schenz is silent about the tear-
10 strength of the carrier tape. The Examiner relies on each of Maeda and
11 Miyamoto to suggest this feature. However, Maeda's concern for the peel-
12 off strength of the cover tape -- peel-off strength between the cover tape and
13 the carrier tape, pulling it apart. Maeda's silent about the tear-strength of the
14 carrier tape itself. Miyamoto discloses the cover tape having an external
15 layer, an intermediate layer, and an adhesive layer where the intermediate
16 layer of the cover tape has a tear-strength of at least 100 kilograms per
17 centimeter. However, a cover tape is not a carrier tape. Neither Schenz in
18 view of Maeda nor Schenz in view of Miyamoto suggests limitation of
19 independent Claims 10 and 15 of an embossed carrier tape comprising a
20 sheet having at least one embossed pocket where the sheet has a tear-
21 strength of at least 105 newtons per millimeter.

22 Furthermore, as discussed in the Reply Brief, the embossed carrier
23 tape tear-strength feature of independent Claims 10 and 15 is neither
24 inherent in the cited prior art nor a result-effective variable. A carrier tape
25 tear-strength of at least 105 newtons per millimeter is not necessarily present
26 in carrier tapes of the same composition and the same thickness. In the

1 Appeal Brief at page 9 of Table A and on page 10, lines 1 through 12, show
2 a comparison of examples, 5, and comparative examples, 2 -- well, shows in
3 this comparison the carrier tapes that both contain a styrene methyl
4 methacrylate copolymer resin and carbon black and are both 500 microns
5 thick have different breakage characteristics.

6 JUDGE FRANKLIN: But those are different materials, they're not
7 made identical, correct?

8 MR. UMBACH: I would imagine they're not identical if you -- yeah,
9 because URX and XX are different. However, in the specification, I guess
10 that's at page -- it discusses this on page 10 of the Appeal Brief. Page 7, line
11 6 -- yeah, 6 and 7, yeah, refer -- Example 5, it says it's a styrene methyl
12 methacrylate copolymer resin referred to as MS in Table 1. And then on --
13 where is it -- let's see -- the bottom of the page of page 7 around lines 21 and
14 22, it says for comparative Example 2 it's styrene methyl methacrylate
15 copolymer resin also. So I mean it's, it's -- both referred to as the same basic
16 resin.

17 JUDGE HANLON: But it doesn't have the same composition then?
18 What, what are the --

19 MR. UMBACH: I don't --

20 JUDGE HANLON: -- what's the difference in --

21 MR. UMBACH: -- composition is a trade name or what.

22 JUDGE HANLON: What's the difference in the -- it looks like you
23 have different symbols in, in that table.

24 MR. UMBACH: I'm sorry?

25 JUDGE HANLON: What's, what's the significance of the different
26 abbreviations in that table in the Brief?

1 MR. UMBACH: You mean referring to the resins?

2 JUDGE HANLON: Yes.

3 MR. UMBACH: I don't know.

4 JUDGE HANLON: So they may or may not be the same?

5 MR. UMBACH: Correct. It depends on how far you want to say
6 "same requires". I mean they are both styrene methyl methacrylate
7 copolymer resin, I mean the specification says that. And they both have
8 carbon black in it, and they're both 500 microns thick, okay. In the breakage
9 tear test that they did, comparative Example 2 broke during a mounting test
10 while Example 5 did not. Comparative Example 2 had a tear-strength of 82
11 nano -- newtons per millimeter which is below the 105 newtons per
12 millimeter of Claims 10 and 15. In contrast, Example 5 had a tear-strength
13 of 117 nanometers -- nanometer, I'm sorry, newtons per millimeter above the
14 105 newtons per millimeter of Claims 10 and 15. These results show that
15 carrier tapes with similar compositions and thicknesses can have quite
16 different breakage characteristics. And that with carrier tape composition
17 and thickness essentially constant, a decrease in carrier tape breakage can be
18 achieved by increasing the tear-strength to at least 105 newtons per
19 millimeter. Because the carrier tape tear-strength is not necessarily at least
20 105 Newtons per millimeter in carrier tapes with the same composition and
21 thickness, the tear-strength feature of Claims 10 and 15 is not inherent in the
22 cited prior art.

23 And regarding the result-effective variable issue, the Examiner's
24 Answer at page 10 asserts that because Miata desires a cover tape with
25 improved tear resistance, that the exact tear-strength of the carrier tape is
26 deemed to be a result-effective variable with regard to the peeling of the

1 cover tape off. However, the claims feature the tear-strength of a carrier,
2 carrier tape, not the tear, not the tear-strength of a cover tape and not the
3 strength of an adhesive bonding the cover tape to the carrier tape. The tear-
4 strength of carrier tape has not been recognized in the art as effective for
5 achieving a result. Appellants were the first to discover that if tear-strength
6 is less than 105 newtons per millimeter, then carrier tape is likely to break
7 during the high-speed mounting.

8 Because a cover tape is not a carrier tape and the cited prior art fails to
9 suggest the carrier tape tear-strength limitation of independent Claims 10
10 and 15, the claims are nonobvious over the cited prior art, And for this
11 reason the final rejection should be reversed. Questions, more questions?

12 JUDGE FRANKLIN: Well, on page 5 of the Answer, the Examiner's
13 position with regard to result-effective variable position, can you comment
14 on this -- where he says that the obvious did increase the tear-strength in
15 order to prevent premature -- the packaging. And this would be something
16 that would --

17 MR. UMBACH: That's to increase --

18 JUDGE FRANKLIN: -- through routine experimentation, you could
19 figure out when the tape's going to tear and under what stress and
20 accommodate the strength that won't tear.

21 MR. UMBACH: The prior art has been looking at the tensile strength
22 of the entire carrier tape which is different units, newtons per millimeter
23 squared, you know, not, not at the tear-strength with -- which has units of
24 newtons per millimeter.

25 JUDGE FRANKLIN: What about the recognition by Miyamoto
26 regarding tear-strength? We understand it's a cover tape.

1 MR. UMBACH: Right, Miyamoto -- right, it's cover tape which is no
2 longer attached to the carrier tape when the carrier tape hits the sprocket.

3 JUDGE FRANKLIN: But they did recognize a certain tear strength
4 that was appropriate.

5 MR. UMBACH: I, I'm sure that tear-strength is, is recognized as a,
6 you know, effective variable for some -- for like for paper. I mean you can
7 tear paper, I mean -- but it hasn't been recognized, you know, as being
8 effective for reducing the breakage of carrier tapes.

9 JUDGE GARRIS: I guess that raises some basic issues of the
10 Examiner's obviousness conclusion with respect to that claimed feature. The
11 Examiner appears to be taking the position that one skilled in this art would
12 have appreciated that the breakage of a, of a carrier tape would, in fact, be
13 related to the tear-strength of the material that the carrier tape is made of. If
14 the Examiner is correct that one skilled in the art would appreciate that as a
15 variable tear-strength as a variable that is relevant to the issue of breakage,
16 the functioning of the carrier tape in this art, then the question is why would
17 the Examiner's conclusion that it would have been obvious to optimize that
18 variable, why is that conclusion incorrect?

19 MR. UMBACH: Because the prior art has been focusing on different
20 -- under different variable, you know, that the tensile strength -- the -- I
21 mean, you know, newtons per millimeter squared. They haven't been
22 focusing on the tear-strength which the inventors, on page 1 of the
23 specification, in the bottom of page 1 around lines 21 through 26 -- it talks
24 about how the present inventors analyzed the mechanism of the break-out.
25 Here they say they're focusing on the sprocket hole portion of the embossed

1 pocket. I mean this is, this is a section of the carrier tape that, you know, the
2 prior art has not been looking at.

3 JUDGE GARRIS: Well, I think the question raised here is we
4 appreciate the applied prior art does not have any express disclosure relating
5 to a recognition of tear-strength as being a result-effective variable. The
6 question is whether one skilled in this art in perceiving breakage of the tape
7 to be a problem in this art would then associate the characteristic of tear-
8 strength of the tape as being a variable that is related to the problem.

9 MR. UMBACH: Would they even think about tear-strength of the
10 carrier tape? I mean they have associated tear-strength with the cover tape
11 in, in one of the secondary references in Myomoto. I mean the thing is in
12 the Appeal Brief on page 9 underneath Table A, I mean it talks -- the results
13 provided showing that even when carrier tape tensile strengths are
14 comparable, tear-strengths can sometimes become low. I mean I think, you
15 know -- I mean this is to show that it's meaningful to define a lower limit for
16 tear-strength and it's not necessarily known by one of skill in the art.

17 JUDGE GARRIS: Well, that's the issue. I think --

18 MR. UMBACH: I mean it, it's a problem out there, carrier tapes are
19 breaking when they're going to high-speed mounting.

20 JUDGE GARRIS: Let me ask the question --

21 MR. UMBACH: But nobody has addressed it.

22 JUDGE GARRIS: -- let me ask the question this way, is there
23 something unusual or surprising about your discovery that there is an
24 association between tear-strength and tape breakage?

25 MR. UMBACH: Relative to what? Are you asking for unexpected
26 results?

1 JUDGE GARRIS: Well, I'm asking whether, in fact, is this something
2 that is predictable or unpredictable? Really, I'm trying to see what is the
3 error in the logic that a material with a poor tear-strength would be more
4 likely to break than a carrier tape material which has high tear-strength.
5 That sounds logical to me --

6 MR. UMBACH: Isn't that looking at our invention and saying oh,
7 you've said that, you know, a high tear-strength, you know, reduces
8 breakage.

9 JUDGE GARRIS: Well, we just don't want to go in circles on this
10 issue. I mean really I'm trying to see a greater insight into the issue of what
11 would one skilled in this art have expected or recognized when addressing
12 the issue of tape breakage. It appears the Examiner's logic is that one skilled
13 in this art would appreciate the tear-strength was one of the variables that
14 might be associated with the problem of tape breakage. And my question
15 then to you is what is -- where is the error in that logic? Is there something
16 unusual or unexpected or unpredictable about the way this variable of tear-
17 strength is associated with tape breakage such that it wouldn't really have
18 been appreciated by those skilled in this art?

19 MR. UMBACH: All I can say is that the references, the prior art,
20 that's been cited against us, do not disclose tear-strength of the carrier tape,
21 and the specification discloses -- which there's no recognition in the prior art
22 of the importance in the tear-strength.

23 JUDGE GARRIS: Okay, Mr. Umbach.

24 Are there any further questions, Judge Hanlon, Judge Franklin?

25 There are no more questions. Thank you very much for coming in
26 today.

- 1 MR. UMBACH: Thank you.
- 2 Whereupon, the hearing concluded AT 1:21 p.m. on
- 3 July 23, 2009.